

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
10 March 2005 (10.03.2005)

PCT

(10) International Publication Number
WO 2005/022246 A1

(51) International Patent Classification⁷: G02F 1/37,
G02B 27/00, H03C 7/00 // G02B 5/00

(21) International Application Number:
PCT/FI2003/000634

(22) International Filing Date: 29 August 2003 (29.08.2003)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant (for all designated States except US): **NOKIA CORPORATION** [FI/FI]; Keilalahdentie 4, FIN-02150 Espoo (FI).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **SCHORPP, Marcus** [DE/FI]; Vaunukatu 35 A 2, FIN-33730 Tampere (FI).

(74) Agent: **TAMPEREEN PATENTTITOIMISTO OY**, Hermiankatu 12 B, FIN-33720 Tampere (FI).

(81) Designated States (national): AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA,

CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE (utility model), EE, ES, FI (utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK (utility model), SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

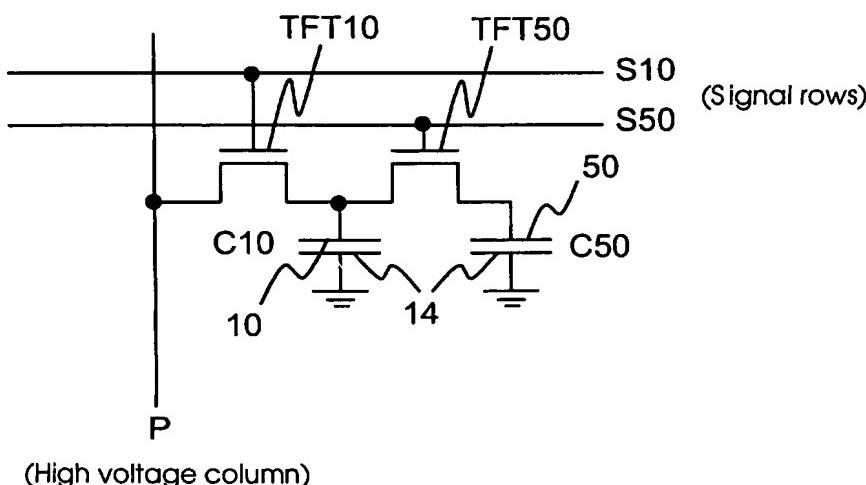
(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ELECTRICAL DEVICE UTILIZING CHARGE RECYCLING WITHIN A CELL



(High voltage column)

(57) Abstract: The invention relates to an electrically controlled device, which device comprises at least one electrically and individually controllable cell (L, R) with a least two separate electrode structures (10, 50) arranged within said cell each of said electrode structures capable of storing electric charges (C10, C50). According to invention the device comprises further charge transfer means (P, S10, S20, TFT10, TFT50) to transfer electric charges in a temporally controlled manner between said at least two separate electrode structures (10, 50), and that for at least one of said the electrode structures within said cell, said charge transfer means comprises substantially the only means for

providing electrical power and or electrical driving. The invention reduces the power consumption of the electrode structures by use of new type of in-cell type charge recycling. The invention is especially suitable to be used in light modulator components based on the use of electrically deformable viscoelastic materials.

WO 2005/022246 A1